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TITLE: Dehumidifier for domestic use, business use, has powder containing mineral salt, gelatinizer and tinction powder with specific properties and color of powder changes when absorbed moisture exceeds specific mass

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ABSTRACTED-PUB-NO: JP 3035706B

BASIC-ABSTRACT: NOVELTY - A powder contains 50-95

mass% of mineral salt and gelatinizer and 5-50 mass% tinction powder having mean particle diameter of 0.001-100 μ m. The mineral salt and the gelatinizer consists of 0.000001-5 mass% of pH conditioner. The powder is contained in a bag-like container having moisture permeability. The color of the powder does not change when water absorption less than 10 mass%.

DETAILED DESCRIPTION - The color of the powder changes when moisture absorption is 10-300 mass%. The bag is sealed at least on one side.

USE - In business use, domestic use.

ADVANTAGE - Easy to identify time of exchange of desiccant by viewing the color change of powder containing mineral salt, gelatinizer, tinction in which color change occurs due to the increase in water absorption.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS:

DEHUMIDIFY DOMESTIC BUSINESS POWDER CONTAIN MINERAL SALT POWDER SPECIFIC PROPERTIES POWDER CHANGE ABSORB MOIST SPECIFIC MASS

DERWENT-CLASS: J01

CPI-CODES: J01-E01;

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㉒発明の名称 育苗用播種機

㉓特 願 平1-170431

㉔出 願 平1(1989)6月30日

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四月 二日 七

1. 発明の名称

育苗用播種機

2. 特許請求の範囲

コンベア4に移送された育苗箱1内の苗床2に種子3を薄く播種装置5が設けられた育苗用播種機に、前記育苗箱1内に跨かれた種子3の分布を検出する播種分布検出装置6を設けたことを特徴とする育苗用播種機。

3. 発明の詳細な説明

【産業上の利用分野】

この発明は、コンベアに移送された育苗箱の苗床に米や野菜などの植物の種子を薄く育苗用播種機に関する。

【従来技術】

従来、育苗用播種機を用いて苗床に種子を跨く場合に、その播種分布、即ち跨かれた種子の量やバラツキの検出は、播種機で作業する人の直視観察によっていた。それによって、苗床に跨かれた種子の分布を判断し、播種量の調節や播種ムラが

生じた苗箱の対処を行なっていた。

【発明が解決しようとする問題点】

従来のように播種分布の確認を作業する人の直視観察によっていると、播種装置に詰まりが生じたりして、突然、播種量が変わったり、播種ムラが生じたりしたときに、他の作業をしていてそれに気付かないことがある。その結果、植株に寄生、或は残生の苗の苗箱ができてしまったり、また一つの育苗箱内で疎密のばらつきの大きいムラのある苗ができてしまう問題があった。また、その問題が起こらないように常に播種分布に異常がないか一つ一つ播種された育苗箱を確認していたのは、他の作業の妨げになる。

【問題点を解決するための手段】

上記の問題点を解決するためにこの発明は、コンベア4に移送された育苗箱1内の苗床2に種子3を薄く播種装置5が設けられた育苗用播種機に、前記育苗箱1内に跨かれた種子3の分布を検出する播種分布検出装置6を設けたことを特徴とする育苗用播種機とした。

【発明の効果】

播種装置5によって育苗箱1内に撒かれた種子3の分布を検出する播種分布検出装置6を設けたことにより、その検出装置6が播種分布を常に検出しているので、播種分布に異常が生じた育苗箱1を見落とすことがなくなり、疎雨バラツキのある苗を育生してしまうことが防止される。また、播種機で作業する人は、育苗箱1内の苗床2への播種分布を常時確認しておく必要がなくなり、作業効率が高まる。

【実施例】

以下に、この発明の一実施例を図面に基づいて詳細に説明する。

1は育苗箱で、合成樹脂からなり底部に多数の排水孔1aが設けられている。育苗箱1内には育苗用に肥料等を配合、調整された土である苗床2が詰められる。その上に育生すべき米や野菜などの種子3が撒かれる。

育苗箱1は、はじめ床土詰め装置7で苗床2が詰めらる。そして、コンベア4で育苗箱1はD方

向に送られる。その移送されてきた育苗箱1の苗床2の上に、この播種装置5で種子3が一様に撒かれる。その後、灌水装置8で灌水され、覆土装置10で覆土される。それぞれの装置7、5、8、10は、育苗箱の短手方向の幅より少し広めの間隔で支持脚24…で支持されている2本のコンベアフレーム23、23上に設けられている。そのコンベアフレーム23、23の間に、電動モーターから伝動され回転する軸22…が設けられ、その軸22…には一体で回動するローラー20…が設けられ、更にそれに対向する従動ローラ20aが設けられて、そのローラー20と20aの間にベルト21…が掛けられてコンベア4…が構成されている。

播種装置5は、第3図に示されるように、ホッパー11内に収納される種子3を播種ロール12が回転しながら繰り出していって、下側に移送されてきた育苗箱1内の苗床2上に播種を行うよう構成されている。また、播種装置フレーム14はコンベアフレーム23上にまたがるように固定

され、コンベア4で移送されてきた育苗箱1が通過できるようになっている。前記播種ロール12にはホッパー11内の種子3を保持する凹部12aがロール全周にわたって一様に設けられている。その凹部12aで一定数粒保持された種子3は、播種ロール12の回転でホッパー11から繰り出され、苗床2上に落下していく。ここで落下せずに凹部12aにひっかかるて保持されたままの種子3は、ブラシ13によって横きだされる。これにより、凹部12aの種詰まりは解消する。

灌水装置8は、第4図に示されるように、移動方向Dに対して散水パイプ15が左右に架設されていて、給水パイプ17から供給される水をその散水パイプ15の軸方向に平行にあけられたスリット状の穴15aから下側に扇状に流し落す。これにより、下側に移送されてきた育苗箱1の苗床2が灌水される。従来は、散水パイプ15には丸孔、或は梢円孔が所定の間隔で設けられていて、その孔から高圧水が噴水していた。そのため、水圧が強すぎたりすると、播種された種子3の播種

分布が乱れたり、灌水の水が周囲に飛散して作業環境を悪化させたりしていた。しかし、この孔を、スリット状の縦長の孔15aにすることによって低水圧でよく、また扇状の水流で苗床2上に供給されるので、前記の不都合は解消される。尚、16は供給水の流量計、18は開閉栓、19はカバーである。

6は播種分布検出装置で、播種ロール12で播種された苗床2上の種子3の分布を検出する。この検出装置6内には、苗床2面に特定の光を照射する発光部と、検出対象に当って反射する光を受ける受光部が設けられている。発光部から発せられる光で照射される対象は、苗床2の床土、或は播種された種子3となる。種子3の照射光に対する反射率は苗床2の土より際立って大きく、その反射率の差を利用して苗床2上の種子3の有無に従う反射光の検出が為されるよう検出感度が適当に設定されている。よって、反射光の感知の有無が、苗床2面の種の有無、即ち分布を示す信号として入力され処理されることになる。コンベア4

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によって育苗箱1が移送され、検出すべき位置がシフトし、苗床2の移送方向Dの播種分布が検出される。移送方向Dに対して左右方向の苗床2面の播種分布は、照射域の狭い発光部とそれと対になる受光部が多数、互いに干渉しないように左右方向に設けて検出される。これで、育苗箱1内の苗床2の全面の播種分布が検出されることになる。

この播種分布検出装置6によって、次々と床土詰め、播種されていく育苗箱1の播種分布が検出されていく。ホッパー11内や播種ロール12の凹部12aに種子3やゴミなどが詰ったりしたり、不測の振動や傾きによって種子3の播種位置が偏ったりして、播種分布が乱れ、種子3の詰かれない箇所が大きい範囲で生じてしまったとき、この播種分布装置6の監視により、その播種ムラは確実に検出される。そして、第4回に示されるように、その検出を受けて播種ムラ苗箱除去装置9が、播種ムラの検出された育苗箱1をピストン25でテーブル33に押出し移動させる。ピストン25は、

まみ34bで調節できるように構成されている。播種量調節つまみ34bを回せば、それに従って播種ロール12の回転数が調節されるようになっている。

ところで、播種機が緊急停止、異常停止した後の再起動を行なう場合、コンペア4は一度所定の距離だけ逆方向に駆動されるようになっている。これは、操作、作業する人、或は設定された制御プログラムによって播種機が緊急停止した場合、その後再び起動させると播種装置5で播種されている途中の苗箱1内には、左右方向に筋状の非播種部が生じてしまう。これは、播種ロール12が停止しても、コンペア4上の育苗箱1は慣性移動して同時に停止しないために生じるものである。そのため、生じた非播種部の分だけ育苗箱1を戻して、停止するまで播種された塊から再び播種を開始するように設けたわけである。これによって、播種機が緊急停止、異常停止した後の再起動を行なう場合に播種ムラが生じるのが防止される。

4. 図面の簡単な説明

ローラー31を架設したフレーム30、30の一側部に固定された支持台29上に固定され、ピストン25のロッド27の先端には、育苗箱1の押し出しを並行に行なわせるバー28が設けられている。また、ピストン25はエアー式で、チューブ26を通じて圧縮空気がシリング部に流入、流出することでロッド27が突出、引退するようになっている。テーブル33には、ピストンロッド27の押し出し突出方向Pに向転するローラー32が回転自在に設けられていて、育苗箱1の移動を滑らかにする。以上のように構成することにより、播種分布に異常を生じた育苗箱1を見落とすことがなくなり、育苗パラツキのある苗を育生してしまうことはなくなる。また、播種機を操作、作業する人は、苗箱1内の苗床2への播種分布を常時確認しておく必要がなくなり、作業性が高まる。

また、播種分布検出装置6での播種分布検出値は、播種量に換算されて播種量調節装置34の表示部34aに表示される。その実際の播種量検出値を確認しながら、所望の播種量に播種量調節つ

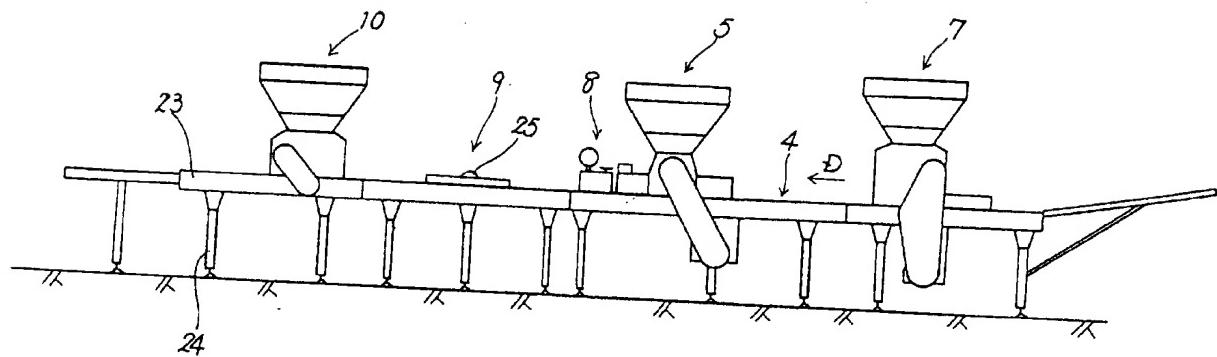
図は、この発明の一実施例を示し、第1図は側面図、第2図は平面図、第3図は要部の断面側面図、第4図は要部の断面正面図、第5図は要部の平面図である。

図中符号、1は育苗箱、2は苗床、3は種、4はコンペア、5は播種装置、6は播種分布検出装置を示す。

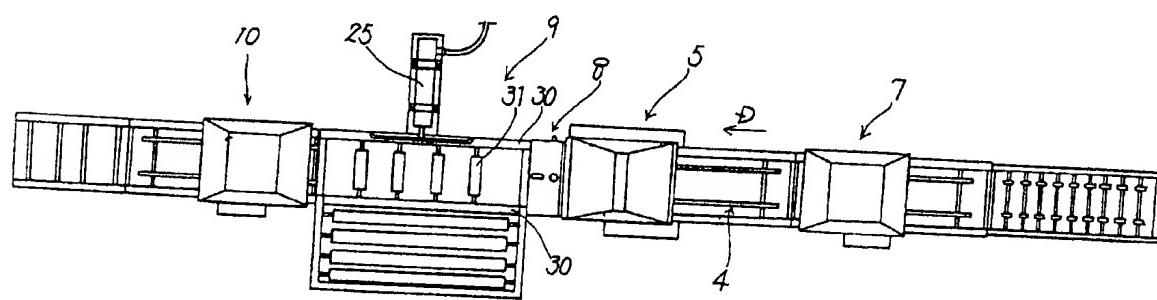
特許出願人の名称

井関農機株式会社
代表者 水田栄久

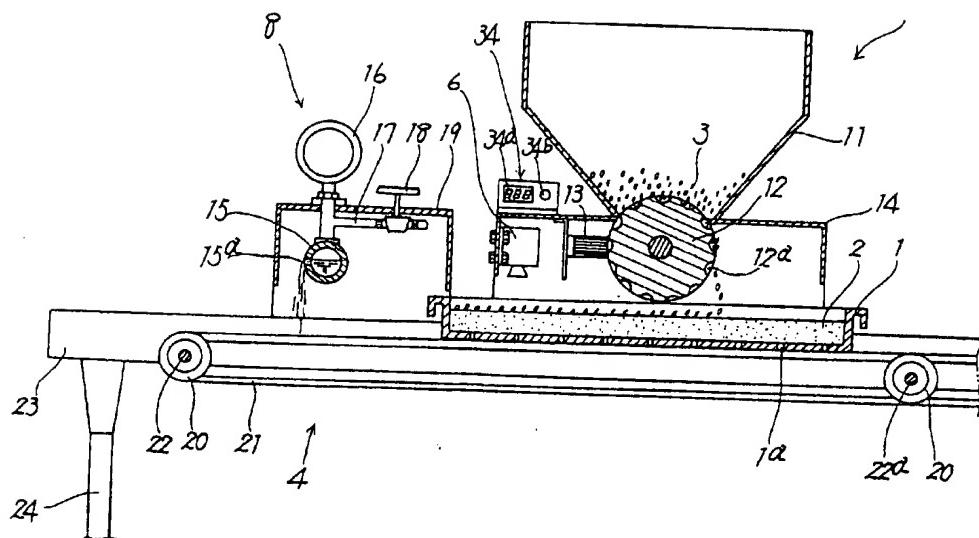
第1 図



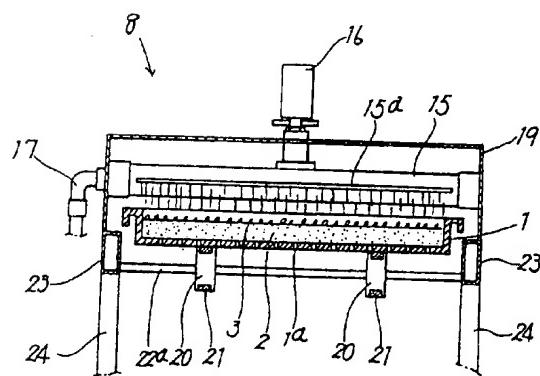
第2 図



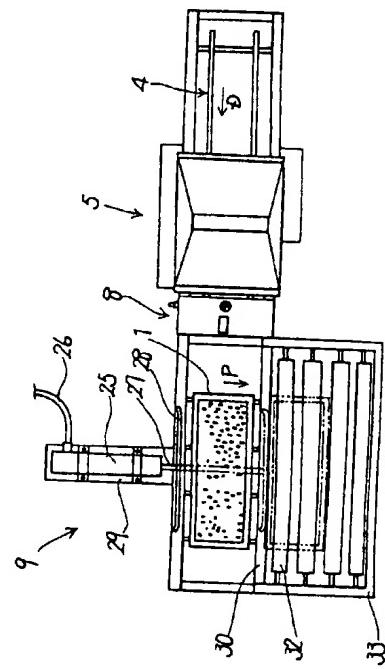
第三回



第4回



第5



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to dehumidification or a drying agent. Furthermore, it is related with the dehumidification or the drying agent using deliquescent mineral in detail.

[0002]

[Description of the Prior Art] Various kinds of dehumidification or the drying agent is broadly used for home use and business use from before, and the deliquescent mineral represented by a calcium chloride, magnesium sulfate, etc. as dehumidification or the drying agent of this purpose is known. Although these deliquescence mineral is usually used, putting into the container of plastics, a moisture permeability film-like container, etc., what used the moisture permeability film-like container is used for the object for drawers, or sum (**) wardrobes. Since deliquescent mineral would become liquefied if water is absorbed moisture so much, when the semipermeable membrane film was damaged, the pinhole opened or the pressure was applied, there was a problem with which the high concentration solution of the deliquescent mineral which absorbed moisture falls or oozes out, and pollutes the circumference. In order to solve this problem, as for what used the moisture permeability film-like container, it is common that combined use addition of the powder, such as a water soluble polymer in which thickening and gelling of the high concentration salts solution which deliquesced with deliquescent mineral are possible, is carried out. However, usually, mixture, such as deliquescent mineral, and a water soluble polymer, an absorptivity resin, had many white things, and since a color tone and a state seldom changed, it had the trouble that the check of the moisture absorption effect, the standard of exchange, etc. were very unclear. The method (JP,1-150532,U, JP,5-212237,A, JP,3-90624,U) of carrying out combined use addition of the coloring agent which colors when ** deliquescence mineral deliquesces and it changes into a water state as a method of solving this problem, the method (JP,6-165907,A) of adding ** anhydrous cobalt chloride, etc. are proposed.

[0003]

[Problem(s) to be Solved by the Invention] However, by the method of the above-mentioned **, although powder, such as commercial food additive coloring matter, was used as a coloring agent, the mean particle diameter of commercial food additive coloring matter or a water-soluble color was usually 100 micrometers or more, and since the viscosity of contents became high in order to use a thickener and a gelling agent together, a coloring agent could not color the whole uniformly, but it had the trouble that discoloration became an ununiformity (the shape of a Pacific cod) extremely. Moreover, usually, since coloring took place shortly after deliquescent mineral absorbs moisture, since the solubility over water is good, as indicators, such as a display at the time of exchange, it was not suitable, and since coloring was too early, coloring began according to slight moisture absorption at the time of stock, and water-soluble coloring matter and a water-soluble color had troubles, like goods value is lost. ** Although the discoloration to in [of the blue shell hydrate salt of the anhydrous salt of an anhydrous cobalt chloride / thin] took place about the method at the time of moisture absorption, since anhydrous salt changed with moisture absorption to a hydrate salt immediately, its discoloration was too early and it had the same problem as **.

[0004]

[Means for Solving the Problem] As a result of this invention persons' inquiring wholeheartedly in view of the above-mentioned situation, since the high-concentration solution of deliquescent salts also absorbs quickly, and serves as gel and change of a uniform color takes place from the middle to the last stage at the time of moisture absorption, the standard of the effect check of moisture absorption, dehumidification, or exchange of a drying agent found out a very intelligible thing, and the dehumidification or the drying agent which consists of deliquescent mineral, a gelling agent, and a coloring agent of a specific size range reached this invention.

[0005] namely, -- this invention -- at least -- one side -- moisture permeability -- a film -- from -- becoming -- a saccate -- a container -- inside -- the following -- (- A --) - - - (- C --) -- and -- the need -- (- D --) -- enclosing -- things -- (- A --) -- receiving -- a water absorption -- ten -- % -- less than -- **** -- discoloration -- not happening -- a moisture absorption -- ten -- -- 300 -- mass -- % -- having resulted -- an

(A): 5 of sum total mass of powder [of deliquescent mineral] and/or granular object; (A), 50 - 95 mass %(B):gelling agent; [of the sum total mass of (B)] (A), and (B) - 50 mass % (C) : it is a 0.000001 - 5 mass %(D):pH regulator to the sum total mass of coloring agent powder; (A) and (B) of 0.001-100 micrometers of mean particle diameters. [0006]

[Embodiments of the Invention] In this invention, powder and/or granular objects, such as a calcium chloride, a magnesium chloride, magnesium sulfate, and a calcium sulfate, are mentioned as (A). The salt in which the anhydrous salt also had water of

crystallization is sufficient as these. Moreover, several sorts of these can also be used together. A calcium chloride and magnesium sulfate are suitably used from both sides of the hygroscopic ability and cost among these. As a particle size of the above (A), although based on the combination method etc., 1-10000 micrometers is a 200-5000-micrometer granular object more preferably.

[0007] (B) used for this invention gels the high concentration solution of deliquescent mineral. Although the polymer of anionic or cation nature is sufficient as long as it can thicken Make the high concentration solution of deliquescent mineral gel quickly, and both the early stages of moisture absorption - the last stage have desirable Nonion nature with strong intensity and, amphoteric water-soluble polymer (E1 and F1), or its bridge formation object (E2 and F2) of gel. A bridge formation object (E2 and F2) is still more desirable at gelling speed or the point that the homogeneity of gelling is high, and especially the bridge formation object (F2) of amphoteric polymer is desirable in respect of [of being so much absorbable quickly also about the solution of the deliquescent mineral of saturation mostly] the early stages of moisture absorption. As water-soluble polymer (E1) which makes a Nonion nature composition unit a subject For example, polysaccharide represented by pregelatinization starch, a dextrin, an alkyl cellulose, the hydroxyalkyl cellulose, etc.; Polyvinyl alcohol, A polyethylene oxide, the saponification object of the copolymer of vinyl acetate and an acrylic-acid (meta) alkyl, Synthetic-macromolecule [of the weight average molecular weight 3,000-10,000,000 represented by the polymerization (**) object with an anionic water-soluble ethylenic unsaturated monomer (h) etc. according to the water-soluble ethylenic unsaturated monomer (i) and need for Nonion nature]; etc. can be illustrated. An acrylic-acid (meta) alkyl means an acrylic-acid alkyl and a methacrylic-acid alkyl, and it indicates like the following monomer (h) is carried out according to the water-soluble ethylenic unsaturated monomer (i) of Nonion nature and need else, such as a bridge formation object of polyvinyl alcohol, a bridge formation object of a polyethylene oxide, and a bridge formation object of water-soluble polysaccharide, and what is constructed for which a bridge and obtained is mentioned. [0008] The following are mentioned as a water-soluble ethylenic unsaturated monomer (i) of the Nonion nature used in order to create the water-soluble polymer (E1) which is the composition unit of these Nonions nature, and its bridge formation object (E2).

(1) Acrylamides; (meta);, such as an acrylamide and N-alkylation (meta) acrylamide [N-methylacrylamide, N, and N-dimethyl acrylamide] etc.

(2) Vinyl amides;;, such as N-vinyl acetamide.

(3) (meta) -- acrylate; -- the carbon number of an alkyl group -- (4) polyalkylene glycol monochrome (meta) acrylate [, such as 2-3 hydroxyalkyl monochrome (meta) acrylate,], --, such as polyethylene-glycol (Mw:100-4000) monochrome (meta) acrylate, polypropylene-glycol (Mw: 100-4000) monochrome (meta) acrylate, and methoxy polyethylene-glycol (Mw:100-4000) monochrome (meta) acrylate, -- as long as these are the water-soluble ethylenic unsaturated monomers of Nonion nature, These monomers (i) may be used independently, and as long as it is required, they may use two or more sorts together. A thing desirable in the water-soluble ethylenic unsaturated monomer (i) of these Nonion nature is an acrylamide (meta) with cheaply good polymerization nature. As an anionic water-soluble ethylenic unsaturated monomer (h) used as occasion demands, an acrylic acid (alkali-metal salt), a maleic acid (alkali-metal salt), a fumaric acid (alkali-metal salt), an itaconic acid (alkali-metal salt), an acrylamide-isobutane sulfonic acid (alkali-metal salt), sulfoalkyl (meta) acrylate, a styrene sulfonic acid (alkali-metal salt), etc. are mentioned, for example (meta). Here, an acrylic acid (meta) (alkali-metal salt) means the alkali-metal salt of an acrylic acid (meta) and/or (meta) an acrylic acid, and it indicates like the following. the degree of neutralization of an anionic water-soluble ethylenic unsaturated monomer (h) unit -- desirable -- 60 - 100-mol % -- it is 70 - 100-mol % still more preferably An anion fully dissociates that the degree of neutralization is more than 60 mol %, and the absorbed dose and rate of absorption increase. Neutralization of (h) is performed by adding alkali-metal salts (hydroxide of alkali metal, such as a sodium hydroxide, a potassium hydroxide, and a lithium hydroxide, etc.). As a desirable thing, the alkali-metal salt and its partial neutralization salt of an acrylic acid (meta) with cheaply good polymerization nature can be mentioned in an anionic water-soluble ethylenic unsaturated monomer (h).

[0009] (i) in the water-soluble ethylenic unsaturated monomer for acquiring the water-soluble polymer (E1) or its bridge formation object (E2) of Nonion nature, and the mass ratio of (h) -- usually -- (i)/(h) =80-100/0 -- it is -- desirable -- (i)/(h) =90-100/0 -- it is (i)/(h) =95-99/5 still more preferably [1-5] [20-0] [10 Since anionic [of the polymer generated as the ratio of (h) is below 20 mass %] does not become strong and the absorbed dose of the high concentration solution of deliquescent mineral does not fall, it is desirable.

[0010] In this invention, what constructed the bridge in the thing (F1) and the arbitrary stages which copolymerized the water-soluble ethylene monomer (i) of this Nonion nature according to the water-soluble ethylene monomer (g) of cation nature, this anionic ethylene monomer (h), and the need as the amphoteric water-soluble polymer (F1) used as (B) or its bridge formation object (F2) (F2) can be mentioned. As an ethylene nature monomer (g) of cation nature Dialkylamino (meta) acrylate and its 4th class salt (reactant with alkyl halide or dialkyl sulfuric acid) [, for example, (meta), acryloyl OKISHIECHIRUTORI ammoniumchloride, or a star's picture, Acryloyloxyethyl trimethylammonium sulfate, (Meta) Acryloyloxypropyl trimethylammonium chloride, (Meta) Or a star's picture,], such as acryloyloxypropyl trimethylammonium sulfate; (Meta) Dialkylamino hydroxyalkyl (meta) acrylate and the 4th class salt of its () [alkyl HARAI] Reactant [, for example, (meta), acryloyl OKISHIHIDOROKISHI ethyl trimethylammonium chloride, or a star's picture with DO or a dialkyl sulfuric acid, (meth)acryloyloxy hydroxyethyl trimethylammonium sulfate,], dialkylamino alkyl (meta) acrylamide and the 4th class salts of its [a reactant with alkyl halide or a dialkyl sulfuric acid], such as acryloyl OKISHIHIDOROKISHIFURO pill trimethylammonium

chloride or a star's picture; Dialkylamino hydroxyalkyl (Meta) (Meta) an acrylamide and the 4th class salt (reactant with alkyl halide or a dialkyl sulfonic acid) of its, and N-alkyl vinyl pyridinium halide [-- for example], such as N-MECHIRU 2-vinyl pyridinium chloride or a star's picture; trimethyl allyl-compound allyl-compound ammonium halide etc. can be mentioned. These cation nature vinyl monomers may be used independently, and may use two or more sorts together. Among the ethylene nature monomers of these cation nature, since the 4th class salt dissociates quickly and swells in the high concentration solution of deliquescent mineral, it is desirable, and since the intensity of gel becomes strong when it is easy to go up the molecular weight of polymer that the counter ion of the 4th class salt is a halogenated compound and the high concentration solution of deliquescent mineral is made to gel, it is still more desirable. Acquisition of a raw material is easy for them, and since dialkylamino (meta) acrylate and the 4th class salt of its are cheap, they are especially desirable.

[0011] this invention -- setting -- being amphoteric -- water-soluble -- polymer (F1) -- and -- the -- bridge formation -- the body (F2) -- creating -- a sake -- a cation -- a sex -- ethylene -- a sex -- a monomer -- (-- g --) -- anionic -- ethylene -- a sex -- a monomer -- (-- h --) -- and -- the need -- adding -- a Nonion -- a sex -- ethylene -- a sex -- a monomer -- (-- i --) -- a ratio -- Since early bloating tendency [as opposed to / that the ratio of (g) is 10 - 90% / deliquescent high-concentration mineral solution] improves, it is desirable. Since too much bridge formation does not take place by calcium ion or Mg ion which are the principal component of deliquescent mineral that the ratio of (h) is 1 - 10 mass %, but neither the absorbed dose nor a degree of swelling falls, and moderate bridge formation takes place and the intensity of gel rises, it is desirable. Moreover, since the solution of deliquescent mineral turns into a saturated-water solution mostly about the early stages of moisture absorption, Although the one where the ratio of the ethylene nature monomer of cation nature is higher is desirable, since the concentration in the solution of Nonion nature becomes [the intensity of gel] high, the first stage -- from -- the last stage -- up to -- being good -- gel -- it can create -- if -- having carried out -- a viewpoint -- **** -- (-- g --) -- 30 - 60 -- mass -- % -- / -- (-- h --) -- one - five -- mass -- % -- / -- (-- i --) -- 30 - 70 -- mass -- % -- further -- being desirable .

[0012] In this invention, the bridge formation object (E2) of the water-soluble polymer which makes a Nonion nature composition unit a subject, or the amphoteric bridge formation object (F2) of water-soluble polymer adds, and makes a cross linking agent (j) construct a bridge in arbitrary stages, and/or is created by heating water-soluble polymer at 130 degrees C or more, and carrying out heat bridge formation. The addition method of a cross linking agent (j) adds the cross linking agent (j1) of the polymerization nature which has two or more double combination in a molecule at the time of a polymerization, adds and makes the reactant cross linking agent (j2) which has the functional group of the water-soluble ethylenic unsaturated monomer which copolymerized with the water-soluble ethylene monomer (g-i), or was used, and two or more functional groups which react construct a bridge after the time of a polymerization, and/or a polymerization. Moreover, you may add and use the cross linking agent (j3) which has at least one piece and at least one polymerization nature double combination for the functional group of a water-soluble ethylenic unsaturated monomer, and the functional group which reacts at the time of a polymerization. although the addition in the case of adding a cross linking agent (j) is based also on the kind of the absorbed dose of the dehumidification or the drying agent to need and water capacity, and cross linking agent to be used -- desirable -- 0.00001 - 10 mass % -- it is 0.001 - 5 mass % still more preferably If an addition may become [gel elasticity] low under by 0.00001 mass % and 10 mass % is exceeded on the other hand, crosslinking density becomes high too much and the amount of swelling and water capacity may fall.

[0013] When using a cross linking agent (j), as a cross linking agent (j1) of polymerization nature Especially if it is the cross linking agent which has and uses two or more double combination in a molecule and in which a water-soluble ethylenic unsaturated monomer (g-i) and copolymerization are possible, there is no limitation. For example, an N and N'-methylene screw acrylamide, ethylene GURIKORUJI (meta) acrylate, TORIMECHI roll pro pansy (meta) acrylate, TORIMECHI roll pro pantry (meta) acrylate, Pen TAERISURITORUJI (meta) acrylate, pen TAERISURITORUTORI (meta) acrylate, Pentaerythritol tetrapod (meta) acrylate, glycerol diaryl ether, The glycerol triaryl ether, trimethylol-propane diaryl ether, The trimethylol-propane triaryl ether, pentaerythritol diaryl ether, the pentaerythritol triaryl ether, the pentaerythritol tetrapod allyl-compound ether, etc. can be illustrated. These (j1) may use two or more sorts together.

[0014] Although based also on composition of the functional group of the polymer made to construct a bridge as a reactant cross linking agent (j2) used for this invention, the polyhydric-alcohol compound represented by the multiple-valued amine compound represented by the multiple-valued isocyanate compound represented by the multiple-valued glycidyl compound represented by ethylene glycol diglycidyl ether etc., MDI, etc., for example, ethylenediamine, etc., the glycerol, etc. can be illustrated. Considering the functional group of a water-soluble ethylenic unsaturated monomer, and the functional group which reacts as at least one piece and a cross linking agent (j3) which has at least one polymerization nature double combination, N-methylol (meta) acrylamide, Grouchy Jill (meta) acrylate, ethylene glycol monoglycidyl monoacrylate, etc. are mentioned, for example. When these reactant cross linking agents (f2 and f3) are used, it is arbitrary stages after cross-linking-agent addition, and it is usually common to heat at 120 degrees C or more preferably, and to advance [100 degrees C or more] crosslinking reaction. Moreover, these reactivity cross linking agent may use two or more sorts together with a polymerization nature cross linking agent (j1) further in the range of the specified quantity.

[0015] The method of acquiring the bridge formation object (E2) of the water-soluble polymer which makes a Nonion nature composition unit a subject, or the bridge formation object (F2) of amphoteric water-soluble polymer according to heat bridge formation without using a cross linking agent Bridge formation between the molecules in a molecule starts preferably in arbitrary stages water-soluble polymer (E1) or (F1) by heating 130 degrees C or more at 150 degrees C or more still more preferably, and a bridge formation object is acquired. If heating temperature exceeds 130 degrees C, since bridge formation will take place

uniformly, it is desirable. Although the heating time in the case of performing heat bridge formation changes with the functional group of the polymer which carries out heat bridge formation, degrees of cross linking, heating temperature, etc., it is usually 1 - 10 hours preferably for 10 minutes to 50 hours. Constructing a bridge heating time may become being 10 or less minutes inadequate, if heating time exceeds 50 hours on the other hand, too much bridge formation may progress or coloring of a bridge formation object may become intense. Since the crosslinking density near the front face of a resin becomes high and can absorb the solution of deliquescent high-concentration mineral quickly, the method of performing dryness and heat bridge formation simultaneously at the temperature to which heat bridge formation takes place at the time of the dryness to which the stage of thing heating in heat bridge formation is later mentioned after a polymerization, the water-soluble polymer (E1) which carried out the pulverization, or (F1) its direction which carried out the pulverization although obtained by the method of heating and which carried out afterbaking is desirable.

[0016] In this invention, the method of irradiating the method of the usual method being sufficient as the method of carrying out the polymerization (**) of the water-soluble ethylenic unsaturated monomer (g-i), for example, carrying out a polymerization using a radical polymerization initiator, radiation, ultraviolet rays, an electron ray, etc. is raised. the method using a radical polymerization initiator -- setting -- as this initiator -- azo compound [4 and 4'-azobis (4-SHIANOBA relic -- acid) -- 2 A inorganic-peroxide [hydrogen peroxide, potassium persulfate, an ammonium persulfate,], such as 2 and 2'-azobis (2-amidinopropane) hydro chloride, An peroxide [G t-butyl peroxide, Reducing agents, such as a sulfite of], such as cumene hydronalium peroxide, and a redox-initiator alkali-metal salt or a bisulfite, an ammonium sulfite, a heavy ammonium sulfite, and L ascorbic acid, peroxides, such as a persulfate of an alkali-metal salt, an ammonium persulfate, and hydrogen peroxide solution, should put together --] and two or more kinds of these combined use are raised

[0017] Although it changes also with kinds of initiator which especially the method of carrying out a polymerization using this initiator is not limited, for example, uses polymerization temperature, in order to lengthen molecular weight still more preferably by -10 degrees C - 100 degrees C preferably, it is -10 degrees C - 80 degrees C. Although there is especially no limitation also about the amount of an initiator, it is 0.000001 - 0.5% still more preferably 0.000001 to 3.0% preferably to the sum total mass of an ethylenic unsaturated monomer. Although the solvent at the time of a polymerization is usually performed by aqueous polymerization using water with few chain transfers, the so-called antiphase suspension polymerization which distributes and suspends the solution of an ethylenic unsaturated monomer as occasion demands under existence of a dispersant and in hydrophobic solvents (for example, a hexane, toluene, a xylene, etc.) can also be used suitably. the polymerization concentration which is the ethylenic unsaturated monomer concentration at the time of a polymerization -- desirable -- ten to 60 mass % -- it is 20 to 50 mass % still more preferably Polymerization concentration is [that it is easy to go up molecular weight by 10 - 60%]

[0018] In this invention, when the water gel of a polymer is obtained according to aqueous polymerization or an antiphase suspension polymerization, it dries as occasion demands. The usual method is sufficient as the dryness method, for example, in the case of the method of performing infiltration dryness (band dryness etc.), and through flow drying (dryness of the ** style etc.) and contact dryness (drum dryer dryness etc.) after subdividing polymerization gel in the case of aqueous polymerization, and an antiphase suspension polymerization, the method of performing reduced pressure drying and through flow drying etc. can be illustrated after solid liquid separation.

[0019] Thus, the dry matter of the obtained cross linked polymer is ground as occasion demands, and carries out the pulverization. The usual method is sufficient as the trituration method, for example, it can be performed by impact grinders (a pin mill, a cutter mill, a clearance rel mill, an ACM PARUPE riser, centrifugal mill, etc.) or air trituration (jet pulverizer etc.). Thus, as for the resin by which the pulverization was carried out, the need reheat, in order to perform heat bridge formation etc. The usual method is sufficient as the heating method, for example, it can illustrate the method of heating heating using the dryer of the ** style, or a tunnel dryer, or promoting [arrange resin powder thinly on a tray,] a resin using equipments, such as a paddle dryer, an omnipotent mixer, and a kneader.

[0020] Although the particle size of (B) used in this invention changes also with the purpose and methods of using it, it is 500-2000 micrometers still more preferably 50-3000 micrometers in a mean particle diameter preferably. Moreover, in particle size distribution, the particle size of 50-3000 micrometers is more than 90 mass % preferably. Since the swelling speed of (B) becomes it quick that a mean particle diameter is 3000 micrometers or less, and the time to dehumidification or gelling of a drying agent becomes quick, and a mean particle diameter turns into particle size of the deliquescent mineral which water-soluble polymer (E1, F1) and a crosslinked polymer (E2, F2) use in 50 micrometers or more closely, and separation with the resin in the time of transportation or a shop front and deliquescent mineral stops being able to happen easily, it is desirable. Moreover, since the swelling speed of (B) becomes it quick that it is more than 90 mass %, the time to dehumidification or gelling of a drying agent becomes quick, particle size distribution serve as particle size of the deliquescent mineral which water-soluble polymer (E1, F1) and a crosslinked polymer (E2, F2) use closely, and separation with the resin in the time of transportation or a shop front and deliquescent mineral stops being able to happen easily, its particle size of 50-3000 micrometers is desirable. [0021] In this invention, (B) is blended with the powder of (A), and/or a granular object, and dehumidification or a drying agent is created. this invention -- setting -- (A) and combination mass % of (B) -- the sum total mass of (A) and (B) -- receiving -- (A) -- usually -- 50 - 95 mass % -- desirable -- 50 - 90 mass % and (B) -- usually -- 50 - 5 mass % -- it is 50 - 10 mass % preferably It is dehumidification -, when it becomes difficult to prevent that deliquescent mineral absorbs moisture and liquefies if the rate of a compounding ratio of (A) exceeds 95 mass % and the ratio of (B) exceeds 50 mass %.

[0022] Dehumidification or the drying agent of this invention adds coloring agent powder (C) from which a color and/or a color tone change for the first time in the stage to which the moisture absorption of deliquescent mineral other than (A) and (B) resulted to 10 - 300%. The thing and/or acid-base indicator which *****ed one sort usually chosen from coloring matter, the color, and the pigment or two sorts or more as (C) used for this invention can be used. The coloring matter which *****s, a color, or a pigment the usual color (direct dye, acid dye, basic dye, a disperse dye, and reactive dye --)

An eye ZOKKU color etc. is good at coloring matter (food additive coloring matter etc.), cobalt chloride anhydrous salt, etc. Discoloration by coloring matter or the color can be delayed and the moisture absorption of (A) can make discoloration cause in 10 - 300%, and the stage of which it consisted by covering and *****ing these coloring matter and a color by water-soluble polymer, such as cyclodextrin and fusibility starch.

[0023] When using an acid-base indicator, it is the stage from which the moisture absorption of (A) became 10 - 300%, pH of an acid-base indicator is changed, and it is made to discolor by guiding to pH transition interval as coloring agent powder. The method of carrying out combined use addition of the pH regulator (D), changing pH in a system to the method of changing pH of the acid-base indicator which uses pH of an acid-base indicator as a method of guiding to pH transition interval using pH at the time of moisture absorption of the mixture of (A) and (B) itself, for example, and making it discolored, (A), and (B) at the time of moisture absorption, and making it color them etc. can be illustrated. As an example of the acid-base indicator used as (C) Be easy although / it] a well-known acid-base indicator is sufficient, for example, it is indicated by the appendix of chemistry important ** (Kyoritsu shuppan Co., Ltd., Inc.) They are extreme acidity and the acid-base indicator which has the transition interval which can be discolored in pH 3-10 even if it does not make it alkaline about pH in [the viewpoint of safety to] a system. Magenta, a bromocresol green, RAKUMOIDO, a cochineal, A hematoxylin, a bromocresol purple, the dibromophenol tetrabromo phenolsulfonphthalein, Discoloration for the blue and the green system which the transition interval represented by a bromothymol blue, a quinoline blue, the ethyl screw (2, 4-dinitrophenyl) acetic acid, etc. is in pH 3-10, and can give an image invigorating as a dehumidification agent is possible.

[0024] Although (D) added as occasion demands in this invention in order to guide pH of an acid-base indicator to a transition interval changes variously with pH at the time of the water of the kind (transition interval) of acid-base indicator to be used, and the mixture of (A) to be used and (B) itself etc. What is necessary is just to choose (D) suitably so that pH in the system at the time of moisture absorption may be changed by addition of pH regulator, it may guide to the transition interval of an acid-base indicator and discoloration and color tone change may take place well. In the viewpoint of the contents from the permeable film mentioned later permeating, and making prevention and the change of pH of **** start gradually, although pH regulator of a liquid is sufficient as (D), the powder type (D) is more desirable. the polycarboxylic acid (or the alkali-metal salt) represented by the poly (meta) acrylic acid, its alkali-metal salt, etc. -- since the dissolution rate is very slow in the solution of deliquescent mineral -- pH in a system -- since it can be made to be able to change gradually and discoloration can be delayed, it is still more desirable. Although there will be especially no limitation if the addition in the case of using (D) can be adjusted to the target pH, in order not to reduce the gelling force of the hygroscopicity of deliquescent mineral, or a gelling agent, 0.001 - 30 mass % is desirable to the sum total mass of (A) and (B).

[0025] As for the coloring agent in this invention, a mean particle diameter usually uses preferably 0.001-100 micrometers of things of the shape of a 0.001-50-micrometer impalpable powder. Although it changes with solubility of the coloring agent to be used etc. when the mean particle diameter of (C) exceeds 100 micrometers, since a coloring agent does not dissolve well but coloring serves as an ununiformity (generating of ****) in many cases, it is not desirable. or [grinding so that the mean particle diameter of an acid-base indicator may turn into a predetermined particle size using the method and/or Air formula crusher (for example, jet mill) which usually carry out the sieve cut of the thing 100 micrometers or more of commercial acid-base indicator powder, or high-speed shock formula crushers (for example, PARUME riser etc.), in order to obtain (C) with such a small mean particle diameter] -- or the method of carrying out a sieve cut after that is mentioned. Moreover, what is necessary is to ***** using cyclodextrin etc., to perform pulverization etc. as occasion demands further, and just to adjust to a predetermined particle size again, after making into the same predetermined particle size the mean particle diameter of the coloring matter used first or a color, when using that which coloring matter and the color *****ed as a coloring agent.

[0026] although the addition of (C) used for this invention changes variously with strength of the kind of coloring agent to be used, and the target color etc. -- usually -- the sum total mass of (A) and (B) -- receiving -- 0.000001 - 10 mass % -- desirable -- (C) under at 0.000001 mass %, a color may not change well, and preferably, since there may be too many amounts of a coloring agent if an addition exceeds 10 mass % on the other hand, and change of a color or a color tone may be unclear even if desirable.

[0027] After blending (C) by the manufacturing processes arbitrary to (B) which arbitrary stages are sufficient as, for example, blend (B) after adding and blending (C) to (A), in case addition of (C) blends (B) with (A) and (A) to blend, it can illustrate the method of adding and blending (C) simultaneously. In addition, although there is also the method of carrying out added to (A) and/or (B) after carrying out dissolution dilution of the (C) at solvents (for example, hydrophilic organic solvents, such as ethanol and a methanol, water, etc.), usually, (A) has many white things, and since a color tone will become strong in many cases if it dilutes to a solvent etc. and the whole system is dyed the color of a coloring agent, it is not desirable [a coloring agent]. It is more

desirable to add according to a irregular reflection phenomenon, on the other hand, with powder, since most colors of a coloring agent disappeared, in order that especially (C) of this invention may use a particle with a small particle size, if a coloring agent is added in the state of powder.

[0028] In dehumidification or the drying agent of this invention, it faces blending (A) and (B), and other additives may be added as occasion demands. As an additive besides the above, although silica gel, a zeolite, a perlite, a bentonite, a BAMYU curite, activated carbon, etc. can be illustrated, for example, if the function of dehumidification or a drying agent is not blocked, it will not be limited especially. Moreover, although it will not be limited especially if it is the range to which the amount used does not block a function, either, below 10 mass % is desirable to the sum total mass of (A) and (B). These additives may carry out combined use addition of the two or more sorts.

[0029] Although gases, such as moisture, are passed like for example, a moisture permeability film in dehumidification or the drying agent of this invention, powder and a liquid use for both sides or one side the film which is not passed, create the container of a saccate, in the container of a saccate, connote dehumidification or a drying-agent constituent, and create creation for dehumidification or a drying agent. The porous sheet which blended and extended the about 0.1-20-micrometer detailed inorganic represented by polyethylene, polypropylene, a polyvinyl chloride, polyester, polyamide polyurethane, etc. can use it suitably. In addition, although it is based also on the moisture permeability of hope since moisture permeability is in the film itself when the urethane of a hydrophilic property etc. is used as a moisture permeability film, it may be necessary to add an inorganic bulking agent etc. and to necessarily, open a stoma in a moisture permeability film. Moreover, the film which laminated the nonwoven fabric and the moisture permeability film for the on-the-strength rise of this moisture permeability film can be used suitably.

[0030] However, usually, the moisture permeability film which usually added the above-mentioned inorganic bulking agent has bad transparency, it uses one side as the moisture absorption layer using the moisture permeability film so that the state inside dehumidification or a drying agent can be observed, when the bad moisture permeability film of transparency is used, since it is hard to check the state inside dehumidification or a drying agent, and another side is desirable [a film] in another field using the usual film with high transparency. Moreover, when the material of these moisture permeability is used, in case sheathing, such as dehumidification or a drying agent, it reaches [which breaks the charge of a sheathing material of non-moisture permeability], and is suitable for use [make //or more nearly actual / to start dehumidification or use of a drying agent] to proper timing by removing etc.

[0031]

[Example] Hereafter, although an example and the example of comparison explain this invention further, this invention is not limited to these. It began to permeate from the absorbed dose to the calcium chloride solution (30% of concentration, 45%) of the gelling agent used for dehumidification or the drying agent of this invention and comparison and dehumidification or the moisture absorption to the calcium chloride in the porosity test of a drying agent, the discoloration degree of contents and the homogeneity of discoloration, the gelling state of contents, pH of the contents after moisture absorption, and the permeable film after moisture absorption, and the sex was examined by the following method. The limitation and % which are not defined show mass % the following.

[0032] The anhydrous calcium chlorides (special grade chemical) 300g and 450g of marketing to a [amount of swelling over calcium chloride solution (30% [of concentration], 45%) of gelling agent] 1 l. beaker were put in respectively according to, the product was promoted, it dissolved, and 30% and 45% of calcium chloride solution was adjusted. After putting in 2.0g of gelling agents into the nylon screen of 250 meshes and carrying out a dipping into 30% and 45% of calcium chloride solution for 5 hours, the nylon screen was pulled up, it drained off water for 30 minutes, and the amount of swelling was measured by the lower formula.

Amount (g/g) of swelling = (nylon screen mass-nylon screen mass after being immersed)/2. [0033] The laminate film and non-moisture permeability film (transparent PP/PE laminate film with a thickness of 30 micrometers) which consist of [porosity test] 16cmx11cm a moisture permeability film [the Pau Lamb and Tokuso make, pore size:5micrometer, and the film made from polyethylene with a thickness of 50 micrometers] and a nonwoven fabric (PP/PE G ZUKOA) were piled up, and the bag with which three sides (1cm each) are heat sealed, and one side consists of a moisture permeability film layer was created. The drying-agent constituent [40g [of granular calcium chloride 2 monohydrates] (Tokuso Make) and gelling agent 10g/and an additive] was put into this bag, the upper part in a bag was heat sealed, and dehumidification or the drying agent was created. this dehumidification or drying agent -- the constant temperature of 30 degrees C and 90% of humidity -- it put into the constant humidity machine, and began to permeate from the discoloration degree of the contents of ** and the homogeneity of discoloration, the gelling state of the contents for every passage of time, pH of the contents of 72 hours after, and the permeable film of 72 hours after the calcium chloride moisture absorption of after (2 hours, 10 hours, 24 hours, and 96 hours), and the whole passage of time, and the sex was observed

Moisture-absorption (%); to the calcium chloride for every passage of time.

Moisture absorption (%) It let the transparent film plane pass for (weight g) x100 [homogeneity of color [of contents], and color] each elapsed time of every of = (dehumidification-agent weight before (weight g)-moisture absorption of the dehumidification agent after moisture absorption (g)) / calcium chloride 2 used monohydrate, the homogeneity of the color of contents and coloring was observed, and the following criteria estimated about the homogeneity of a color.

O : the whole is coloring uniformly.

**: It is coloring in the shape of a Pacific cod in part.

x: The coloring of appearance is very bad at the shape of a Pacific cod.

The gelling state of the contents for every [gelling state of contents for every passage of time] passage of time was observed, and the following criteria estimated.

O : contents are gelling completely and the intensity of gel is strong.

O : contents are gelling nearly completely.

**: Although contents are thickening, a fluidity is in contents.

x: All the all [a part or] are liquefied.

The bag after the [pH of contents after moisture absorption (96 hours after)] porosity test was torn, contents were taken out, and PH of contents was checked using the pH meter.

The bag which began to permeate from a [porosity test backward permeable film, and performed the sex] porosity test was saved for further one month, and it observed whether contents will begin to permeate from a moisture permeability film.

[0034] The oxidized starch powder (pH of the starch itself is 6.1) of 1000 micrometers of mean particle diameters of example 1 marketing over which the bridge was constructed was used as a gelling agent (1). The absorbed dose to the calcium chloride solution (30% of concentration, 45%) of this gelling agent (1) is shown in Table -1. This gelling agent (1) The fine-particles blend of 10g and the bromocresol-green (pH:1.6 of acid-base indicator itself, pH transition-interval:(yellow)3.8-5.4 (blue)) 0.001g pulverized to 40g of granular calcium chloride 2 monohydrates of 2000 micrometers of mean particle diameters and 10 micrometers of mean particle diameters was carried out uniformly, and dehumidification or the drying-agent constituent of this invention was created. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The result is shown in Table -2.

[0035] an example 2 -- as bromothymol-blue (pH:1.8 of acid-base indicator itself, pH transition-interval:(yellow)6.0-7.6 (blue)) 0.001g of the non-neutralized type pulverized to this gelling agent (1)10g, 40g of granular calcium chloride 2 monohydrates of 2000 micrometers of mean particle diameters, and 10 micrometers of mean particle diameters, and pH regulator The

fine-particles blend of the polyacrylic-acid Na(polymer pH:9.6)5g of marketing was carried out uniformly, and dehumidification or the drying-agent constituent of this invention was created. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The result is shown in Table -2.

[0036] To the beaker of 35l. of examples, 16.5g [of 48% of sodium-hydroxide solution], 50% acrylamide 1391.6 g (9.8 mols) solution, and pentaerythritol triaryl ether 0.5g and 1390g of water were added to 14.4g (0.2 mols) of acrylic acids, and it cooled at 5 degrees C. after putting this solution into the heat insulation polymerization tank and setting the dissolved acid quantum of a solution to 0.1 ppm through nitrogen, 0.0005g [of 35% of hydrogen peroxide solution], L-ascorbic-acidg [0.00025] and 4, and 4'-azobis (4-SHIANOBA relic -- acid) 0.125g was added Postpolymerisation began for about 30 minutes, the highest attainment temperature of about 75 degrees C was reached about 5 hours after, the polymerization was completed, and the polymerization object of a water gel was obtained. After subdividing this gel with a meat chopper, using the band dryer (an infiltration dryer, the Inoue metal incorporated company make), it dried for 1 hour, it ground at 120 degrees C, and the white gelling agent (2) of 600 micrometers of mean particle diameters was obtained. The absorbed dose of 30% and 45% of calcium chloride solution of this gelling agent (2) is shown in Table -1. The commercial food additive coloring matter blue No. 1 was ground to 3 micrometers of mean particle diameters using the jet pulverizer. After putting into cyclodextrin 500g and 500g biaxial kneader of water and kneading, 50g of pulverized No. 1 blue was added, and it kneaded further. After freeze-drying a kneading object, the impalpable powder of the coloring matter which ground and *****ed to 20 micrometers of mean particle diameters using the jet mill was created. Gelling agent (2) After carrying out the fine-particles blend of the coloring matter of 10g and 20 micrometers of mean particle diameters which it *****ed uniformly 0.002g, 40g of granular calcium chlorides was added, it mixed uniformly, dehumidification or the drying-agent constituent of this invention was created, and the porosity test was performed. The result is shown in Table -2.

[0037] To the beaker of 43l. of examples, 658g of 50% solution and 3.5g of sodium hydroxides of acryloyloxyethyl trimethylammonium chloride 350g, 21g of acrylic acids, and an acrylamide, and 967.5g of ion exchange water were added, and it mixed uniformly to it, and cooled to it at 0 degree C. after putting this solution into the heat insulation polymerization tank and setting the dissolved acid quantum of a solution to 0.1 ppm through nitrogen, 0.0005g [of 35% of hydrogen peroxide solution], 0.00025g [of L ascorbic acid], ferric-sulfatesg [0.00003] and 4, and 4'-azobis (4-SHIANOBA relic -- acid) 0.125g was added

Postpolymerisation began for about 5 minutes, the highest attainment temperature of about 85 degrees C was reached about 5 hours after, the polymerization was completed, and the polymerization object of a water gel was obtained. After subdividing with a meat chopper, using the band dryer (an infiltration dryer, the Inoue metal incorporated company make), it dried for 1 hour, and this gel was ground at 120 degrees C, and was ground to 1000 micrometers of mean particle diameters. The white gelling agent (3) which carried out heat bridge formation, and (pH 5.5 of polymer) were obtained by putting the ground polymer by the thickness of thickness abbreviation 5mmg on the tray made from aluminum, and heating it in a 150-degree C fair wind dryer for about 5 hours. The absorbed dose of 30% and 45% of calcium chloride solution of this gelling agent (3) is shown in Table -1.

This gelling agent (3) The fine-particles blend of the BUROMO chlorophenol blue (pH:1.6 of the acid-base indicator itself, pH transition-interval:(yellow)3.2-4.8 (blue)) of the non-neutralized type pulverized to 10g, 40g of granular calcium chloride 2 monohydrates of 2000 micrometers of mean particle diameters, and 10 micrometers of mean particle diameters was carried out uniformly, and dehumidification or the drying-agent constituent of this invention was created. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The

result is shown in Table -2.

[0038] To the beaker of 53l. of examples, methacryloiloxy-ethyl trimethylammonium chloride 420g, 21g [of acrylic acids], 518g [of 50% solution of an acrylamide], N, and N-methylene screw acrylamide 0.3g and 3.5g of sodium hydroxides, and 1035g of ion exchange water were added, and it mixed uniformly to it, and cooled to it at 0 degree C. after putting this solution into the heat insulation polymerization tank and setting the dissolved acid quantum of a solution to 0.1 ppm through nitrogen, 0.0005g [of 35% of hydrogen peroxide solution], 0.00025g [of L ascorbic acid], ferric-sulfatesg [0.00003] and 4, and 4'-azobis (4-SHIANOBA relic -- acid) 0.125g was added Postpolymerisation began for about 5 minutes, the highest attainment temperature of about 78 degrees C was reached about 5 hours after, the polymerization was completed, and the polymerization object of a water gel was obtained. After subdividing this gel with a meat chopper, using the band dryer (an infiltration dryer, the Inoue metal incorporated company make), it dried for 1 hour, it ground at 120 degrees C, and ground to 1000 micrometers of mean particle diameters, and (4) and (pH 5.1 of polymer) were obtained. The absorbed dose of 30% and 45% of calcium chloride solution of this gelling agent (4) is shown in Table -1. This gelling agent (4) The fine-particles blend of the bromophenol blue (pH: 1.6 of the acid-base indicator itself, pH transition-interval:(yellow)3.0-4.6 (blue)) of the non-neutralized type pulverized to 10g, 40g of granular calcium chloride 2 monohydrates of 2000 micrometers of mean particle diameters, and 10 micrometers of mean particle diameters was carried out uniformly, and dehumidification or the drying-agent constituent of this invention was created. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The result is shown in Table -2.

[0039] The fine-particles blend of No. 1 (mean particle diameter : 150 micrometers) gelling agent (1)10g, 40g of granular calcium chloride 2 monohydrates, and 0.001g of food additive coloring matter blue used in the example of comparison 1 example -1 was carried out uniformly, and comparative dehumidification or a comparative drying-agent constituent was created. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The result is shown in Table -2.

[0040] 5g of 10% (special-grade-chemical, anhydrous salt:blue, hydrate-salt:thin pink) solution of cobalt chlorides was added to comparison 2 marketing, and the coat of the front face of polymer was carried out in cobalt chloride solution. This polymer was dried with the dryer of the ** style at 110 degrees C for 1 hour, and the gelling agent (5) colored blue by the cobalt chloride was created. The absorbed dose of 30% and 45% of calcium chloride solution of this gelling agent (5) is shown in Table -1. Gelling agent (5) The fine-particles blend of 10g and the 40g of the granular calcium chloride 2 monohydrates was carried out uniformly, and comparative dehumidification or a comparative drying-agent constituent was created. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The result is shown in Table -2.

[0041] It replaced with the BUROMO chlorophenol blue of the non-neutralized type of 10 micrometers of mean particle diameters currently used as a coloring agent in the example of comparison 3 example 4, and comparative dehumidification or a comparative drying-agent constituent was created by the same method as an example 4 except having used BUROMO chlorophenol blue (pH: 7.1 of the acid-base indicator itself, pH transition-interval:(yellow)3.2-4.8 (blue), mean-particle-diameter:180micrometer) commercial neutralization type. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The result is shown in Table -2.

[0042] Comparative dehumidification or a comparative drying-agent constituent was created by the same method as an example 2 except having not added polyacrylic-acid Na which is pH regulator used in the example of comparison 4 example 2. Dehumidification or the drying agent was created by the method indicated by the above-mentioned examining method, and the porosity test was performed. The result is shown in Table -2.

[0043]

[Table 1]

ゲル化剤	ゲル化剤のタイプ	塩化カルシウム水溶液吸収量 (g/g)	
		30%水溶液	45%水溶液
ゲル化剤 (1)	ニオノ系ポリマー架橋体	18	6
ゲル化剤 (2)	ニオノ系ポリマー架橋体	25	4
ゲル化剤 (3)	両性系ポリマー架橋体	38	20
ゲル化剤 (4)	両性系ポリマー架橋体	40	18
ゲル化剤 (5)	ニオノ系水溶性ポリマー	18	2

[0044]
[Table 2]

実施例	ゲル化剤	初期の除湿剤の色	吸湿試験 (30°C × 90% RH)						
			2時間後		10時間後			24時間後	
			吸湿率	除湿剤の色	吸湿率	除湿剤の色	ゲル化状態	吸湿率	除湿剤の色
実施例1	(1)	白色	12%	白色	52%	白色	○	110%	青色
実施例2	(1)	白色	12%	白色	54%	白色	○	108%	白色
実施例3	(2)	白色	12%	白色	51%	薄青色	△～×	110%	青色
実施例4	(3)	白色	11%	白色	52%	白色	○	108%	青色
実施例5	(4)	白色	12%	白色	53%	一部青色	○	112%	青色
比較例1	(1)	白色	11%	青色	51%	青色	○	108%	青色
比較例2	(5)	青色	12%	白色	51%	白色	×	110%	白色
比較例3	(3)	白色	13%	青色	53%	青色	○	106%	青色
比較例4	(1)	白色	12%	白色	52%	白色	○	108%	白色

実施例	ゲル化剤	吸湿試験					透湿膜からの内容物の沁み出し	酸塩基指示薬pH変色域		
		72時間後						初期pH	変色域	
		吸湿率	除湿剤の色	発色の均質性	ゲル化状態	内容物のpH				
実施例1	(1)	280%	青色	○	△	6.1	無	1.8	3.8～5.4	
実施例2	(1)	276%	青色	○	△	7.7	無	1.8	6.0～7.6	
実施例3	(2)	282%	青色	○～△	○～△	7.1	無	—	—	

[0045] The following thing is clear from Table 1 and Table 2

** Unlike dehumidification or the drying agent of the examples 1-4 of comparison, the moisture absorption to a calcium chloride does not discolor at all at less than 10%, but a moisture absorption covers dehumidification or the drying agent of examples 1-5 over 10 - 300% of range (from the middle of moisture absorption to the last stage), it colors, and the color of dehumidification or a drying agent is changing completely. Moreover, dehumidification or the drying agent of examples 1-5 has very uniform coloring compared with dehumidification or the drying agent of the examples 1 and 3 of comparison.

** Since the absorbed dose to the calcium chloride solution of saturated concentration (45%) of the thing using the bridge formation object of amphoteric polymer as a gelling agent is also high compared with what used Nonion nature polymer as a gelling agent, it can make contents gel completely from the early stages of moisture absorption to the last stage. [0046]

[Effect of the Invention] Dehumidification or the drying agent of this invention does the following effects so
** As for dehumidification or the drying agent of this invention.

As for dehumidification or the drying agent of this invention, it is very intelligible from the outside whether it did not discolor in early stages of moisture absorption, but applied to the middle of moisture absorption - the last stage, discoloration took place, and since the discoloration is homogeneous, dehumidification or the drying agent has absorbed moisture, and the standard of dehumidification or exchange of a drying agent tends [very] to judge it.
** In order not to discolor the material.

** In order not to discolor the early stages of moisture absorption, there is no possibility that discoloration may start again at the time of the stock in a shop front, a warehouse, etc.

** When the still more nearly amphoteric polymer as a gelling agent is used, apply to the early stages of moisture absorption - the last stage, absorb and retain the high concentration solution of the polyvalent metallic salt to which deliquescent mineral like a calcium chloride or magnesium sulfate absorbed moisture quickly and so much, and it becomes the solid-state of a gel. Therefore, even if a pinhole etc. opens to the dehumidification or the drying-agent container which absorbed moisture, the solution of the salts which deliquesced falls, or it begins to permeate, and the exterior is not polluted. since the above-mentioned effect is done so, dehumidification or the drying agent of this invention considers as the business-use dehumidification in home use, such as a closet, a wardrobe, and a kitchen, a dining-room, and a warehouse etc., or a drying agent and is useful.

[Translation done.]